

Youngsters' Approaches to the Fruit Problem

In a third-grade classroom, students were working on the following problem: Every Christmas my father gets big boxes of fruit from his company. We get so many pieces of fruit that we have to give some away. This year we ended up making 24 grocery bags of fruit with 16 pieces in each bag. How many pieces did we bag altogether?

Make sense of the following students' work on this problem. Justify, using your knowledge of place value and of multiplication, each of their methods. Then, use each method to find the total number of pieces of fruit in 30 grocery bags if 14 pieces are in each bag.

1.

$$\begin{array}{r}
 20 \times 10 = 200 \\
 20 \times 6 = \underline{120} \\
 320 \\
 4 \times 10 = 40 \\
 4 \times 6 = \underline{24} \\
 64 \\
 \underline{320} \\
 384
 \end{array}$$

2.

$$\begin{array}{r}
 16 \rangle 32 \\
 16 \rangle 32 \\
 16 \rangle 32 \\
 16 \rangle 32 \\
 16 \rangle 32 \\
 16 \rangle 32 \\
 16 \rangle 32 \\
 16 \rangle 32 \\
 \text{(continued 24 times)}
 \end{array}$$

3.

$$\begin{array}{r}
 80 \rangle 40 \rangle 24 \rangle 8 \\
 16 \rangle 40 \rangle 24 \rangle 8 \\
 \underline{96} \\
 96 \\
 \underline{96} \\
 192 \\
 \underline{192} \\
 384
 \end{array}$$

4.

$$\begin{array}{r}
 16 \times 12 = 10 \times 12 = 120 \\
 6 \times 12 = \underline{72} \\
 192 \\
 \underline{192} \\
 384
 \end{array}$$

(Note: In the second method, the child actually wrote 16 twenty-four times.)